

crispprd 1.0



Abstract

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PI Name: HINES, TINA C.

PI Title:

Project Title: CARDIAC RECEPTOR ACTIVITY IN THE PRGNANT RAT

Abstract: *Increased blood volume and decreased blood pressure are early and sustained alterations of pregnancy that are directly correlated with positive outcomes. The chronic maintenance of these cardiovascular adjustments implies a significant change in autonomic regulatory pathways, and it is known that reflex effects mediated by these pathways are attenuated during rat and human pregnancy, and further blunted during diseases, such as preeclampsia. One of our long-term objectives is to characterize alterations in these neural reflex pathways during pregnancy and to elucidate mechanisms involved. Understanding changes in these cardiovascular regulatory systems will improve clinical management of blood volume and pressure during pregnancy. Using the pregnant rat model, which undergoes hemodynamic changes similar to those in humans, we have demonstrated that afferent discharge in the autonomic receptors, which regulate blood volume and blood pressure, is attenuated during pregnancy. One explanation for a reduction in cardiac receptor sensitivity is the suggestion that pregnancy actually represents an "underfilled" state, and this concept will be explored in the present proposal. In addition, we are investigating the role of alterations in wall stretch and local paracrine factors in the reduction of afferent receptor firing during pregnancy. Based on our findings in the current funding cycle, three aims are proposed for this competing renewal: Aim #1: we will determine if exogenous blood volume expansion restores cardiac receptor activity in the late-pregnant rat to levels observed in the nonpregnant animal, and if volume expansion has a differential effect in the early-pregnant animal; Aim #2: right atrial pressure/dimension relationships will be measured in late-pregnant and nonpregnant animals to gain a better understanding of the degree of stretch "sensed" by cardiac receptors; Aim #3: we will determine whether nitric oxide and/or endothelin, substances*

known to decrease baroreceptor firing in nonpregnant animals, mediate the reduction in cardiac and baroreceptor activity we have observed during pregnancy. The proposed research plan stems logically from the investigator's currently funded work on alterations in autonomic regulation of cardiovascular function during pregnancy. Data collected during the current grant period have provided intriguing new information about gestational modulation of autonomic receptor activity in the gravid rat. In this competitive renewal we will focus our efforts on mechanisms involved in these changes of pregnancy. The insights gained from these investigations will extend the understanding cardiovascular control in a heretofore-unstudied component of autonomic regulatory pathways in pregnancy, and will further elucidate physiologic as well and pathologic mechanisms of blood volume and blood pressure control during pregnancy that will broaden our knowledge base for clinical management of the pregnant woman.

Thesaurus Terms:

blood volume, hemodynamics, neuroregulation, pregnancy circulation, receptor expression, receptor sensitivity, stretch receptor atrium, autonomic reflex, baroreceptor, endothelin, heart dimension /size, heart electrical activity, heart rate, intracardiac pressure, mechanical stress, nitric oxide, stretch reflex, sympathetic nervous system, vascular resistance, vasomotion female, laboratory rat

Institution: UNIVERSITY OF MISSOURI KANSAS CITY
5100 ROCKHILL RD
KANSAS CITY, MO 64110

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